

We Claim:

1. An injection molding apparatus comprising:
 - a first manifold having a first manifold channel for receiving a first melt
 - 5 stream of moldable material under pressure, said first manifold channel having a first outlet for delivering the first melt stream to a first nozzle channel of a nozzle;
 - a second manifold having a second manifold channel for receiving a second melt stream of moldable material under pressure, said second manifold channel having a second outlet for delivering the second melt stream to a second nozzle
 - 10 channel of said nozzle;
 - a mold cavity receiving said first melt stream and said second melt stream from said nozzle, said first nozzle channel and second nozzle channel communicating with said mold cavity through a mold gate;
 - a gating mechanism for selectively enabling communication between said first
 - 15 nozzle channel, said second nozzle channel and said mold gate;
 - an injection piston extending through a channel located between said first outlet of said first manifold and said first nozzle channel of said nozzle, said injection piston being slidable through said channel and having an outer wall for abutting an inner wall of said channel, said injection piston being movable from a retracted
 - 20 position to an extended position to force melt towards said mold cavity;
 - wherein movement of said injection piston towards said extended position forces melt located in a melt chamber of said first nozzle channel to flow into said mold cavity.
- 25 2. An injection molding apparatus as claimed in claim 1, wherein a predetermined volume of melt is located in said melt chamber of said first nozzle channel.
3. A method of forming a molded product from at least two different materials
- 30 comprising the steps of:

injecting a first material into a mold cavity via a valve gated nozzle having a first melt channel, injecting a second material into a melt chamber located at least partially in a second melt channel of said valve gated nozzle

5 further injecting said second material from said melt chamber into said mold cavity by operating an injection piston which is in fluid communication with said melt chamber

4. An injection molding apparatus comprising:
a hot runner injection nozzle having a first melt channel and a second melt
10 channel;
a valve gating mechanism to control the flow of a first molten material and a second molten material via said first and said second melt channel through a mold gate;
a melt chamber located in one of said first and second melt channels located at
15 least partially in said hot runner injection nozzle; and
an injection piston in communication with said hot runner injection nozzle to inject a metered amount of molten material from said melt chamber into said mold cavity.

20 5. An injection molding apparatus comprising:
a manifold having a first manifold channel for receiving a first melt stream of moldable material under pressure and a second manifold channel for receiving a second melt stream of moldable material under pressure, said first melt stream exiting said manifold through a first manifold outlet and said second melt stream exiting said
25 manifold through a second manifold outlet;
a first nozzle channel extending through a nozzle for receiving said first melt stream from said first manifold outlet;
a second nozzle channel extending through said nozzle for receiving said second melt stream from said second manifold outlet;

a mold cavity for selectively receiving said first melt stream and said second melt stream from said nozzle, said first nozzle channel and second nozzle channel communicating with said mold cavity through a mold gate;

an injection piston movable within at least a portion of said first nozzle channel, said injection piston being slidable between a retracted position and an extended position;

wherein movement of said injection piston towards said extended position forces melt located in a melt chamber of said first nozzle channel to flow into said mold cavity.

10

6. An injection molding apparatus as claimed in claim 5, further comprising a valve pin, said valve pin being slidable through said first nozzle channel and at least a portion of said second nozzle channel, said valve pin being movable between an open position, a partially open position, in which communication between said first nozzle channel and said second nozzle channel is blocked, and a closed position, in which said valve pin engages said mold gate.

15

7. An injection molding apparatus as claimed in claim 6, wherein said first melt channel is surrounded by said second melt channel.

20